

**REMARKS**

Claims 6-9, 13-23, and 30 are pending and rejected.

Claims 6, 13, 18, and 21 have been amended to recite a transgenic plant comprising a nucleic acid encoding a microbial endocellulase or endoglucanase. Support is in the specification on page 10, line 6; page 3, line 21 and page 6, line 7.

Claims 7-9, 13-21 and 30 have been amended to recite the "transgenic plant". Support is in the specification on page 7, first paragraph.

Claim 13 has been amended to correct an obvious error to delete the word "derives" and replace it with "is derived".

Claim 12 has been cancelled without prejudice.

No new matter has been added by these amendments.

**Objections to the Drawings**

Figure 1 was objected to for reasons in FTO Form 948. A corrected version of Figure 1 is submitted herewith, and should overcome the objections.

**Objection to Claim 13**

Claim 13 is objected to for reciting the word "derives" instead of "is derived". The claim has been amended to correct this error and this amendment overcomes the objection.

**Rejection under 35 U.S.C. § 112, second paragraph, Indefiniteness**

Claims 6, 12-13 and 21 are rejected under section 112, second paragraph, as allegedly being indefinite for the recitation of the word "cellulases". In particular, the Office Action points out that the definition for cellulases in the specification includes three enzymes:  $\beta$ -1,4-endoglucanases (EC 3.2.1.4),  $\beta$ -1,4-exoglucanases (EC 3.2.1.91) and 1,4- $\beta$ -D-glucosidases (EC 3.2.1.21). However, the Office Action contends that "in Applicants arguments filed April 12, 2004, Applicant quotes Lashbrook et al. to state that endo- $\beta$ -1,4-glucanase (EC 3.2.1.4) is not a cellulase." Thus, the Examiner is confused as to what Applicant intends to encompass by the term "cellulase."

Applicants respectfully disagree with this rejection, however, in order to advance prosecution of certain embodiments of the invention, the claims have been amended to recite transgenic plants comprising a nucleic acid encoding an endocellulase or endoglucanase.

Regarding the language of the claims, Applicant points out that what is required by the second paragraph of section 112 is that the claims set out and circumscribe the particular area which the patent applicant regards as his invention with a reasonable degree of precision and particularity. *In re Moore*, 439 F.2d 1232 (CCPA 1971).

“[A]cceptability depends on ‘whether one of ordinary skill in the art would understand what is claimed . . . in light of the specification,’ even if experimentation may be needed.” *Andrew Corp. v. Gabriel Electronics, Inc.*, 847 F.2d 819, 821 (Fed. Cir. 1988) (citing *Seattle Box Co. v. Industrial Crating & Packing*, 731 F.2d 818, 826 (Fed. Cir. 1984)), cert. denied, 488 U.S. 927 (1988).

Applicant respectfully point out there seems to be some confusion between the use of the term "cellulase" and the term "endocellulase" or "endoglucanase." The claims have been amended to recite the terms endoglucanases or endocellulases rather than the more generic term "cellulases".

The term "cellulase" is a generic term to describe enzymes that degrade cellulose. The enzymes customarily called "cellulases" are from the Enzyme family GH9 (Glycoside Hydrolase Family 9), which was formerly called Cellulase Family E (See CAZy database, Family GH9, exhibit A). The known activities in this family are endoglucanase (EC 3.2.1.4); cellobiohydrolase (EC 3.2.1.91); and  $\beta$ -glucosidase (EC 3.2.1.21).

The present specification defines cellulase-degrading enzymes on page 10 of specification as "include cellulases, cellobiohydrolases, cellobioses and other enzymes involved in breaking down cellulose and hemicellulose into simple sugars such as glucose and xylose." The specification also describes that "[a]t least three enzymatic activities are required to accomplish this task.  $\beta$ -1,4-endoglucanases (EC 3.2.1.4; also called endocellulases) cleave  $\beta$ -1,4-glycosidic linkages randomly along the cellulose chain.  $\beta$ -1,4-exoglucanases (EC 3.2.1.91, also called cellobiohydrolases, CBH) cleave cellobiose

from either the reducing or the non-reducing end of a cellulose chain. 1,4- $\beta$ -D-glucosides (EC 3.2.1.21, also called cellobioses) hydrolyze aryl- and alkyl- $\beta$ -D-glucosides."

The Restriction Requirement dated February 4, 2002, divided the invention into four groups:

- I. Claims 6-9 and 11-15 drawn to a plant expressing a cellulase, classified in class 800, subclass 288;
- II. Claims 6-9 and 11-15 drawn to a plant expressing a cellobiohydrolase, classified in class 800, subclass 284;
- III. Claims 6-9 and 11-15 drawn to a plant expressing a cellobiose, classified in class 800, subclass 298; and
- IV. Claim 10 drawn to a package, classified in class 47, subclass 65.

Applicants have amended the claims to use the terms "endocellulases and endoglucanases" that are more descriptive for Group I of the restriction group.

Regarding Lashbrook et al., Applicants respectfully point out to the Examiner that even Lashbrook admits that the enzymes he describes in this article in The Plant Journal 6:1485-1493 as EGases are NOT cellulases because "although the term 'cellulase' has been widely used to describe these endoglucanases, the term is misleading in view of the current lack of evidence for EGase-catalyzed cellulose degradation." (page 1486, col. 1, first paragraph).

Applicants submit the amendments and above remarks overcome this rejection, and request its withdrawal.

**Rejections under 35 U.S.C. § 112, first paragraph, Written Description**

Claims 6-9, 12-23, and 30 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the art that the inventors were in possession of the claimed invention at the time the application was filed. The Examiner asserts that neither the specification nor the prior art describe the sequence of genes

encoding endocellulases, exocellulases, or cellobioses to the full breadth of the claims. Applicants respectfully disagree with this rejection.

The legal standard for meeting the written description requirement under section 112, first paragraph, is whether “the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed.” *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111,1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed.

The patent application need not teach what is already known to those of ordinary skill in the art (*Hyatt v. Boone*, 146 F.3d 1348, 47 USPQ2d 1128(Fed. Cir. 1998) citing *In re Eligroth*, 419 F.2d 918, 921, 164 USPQ 221, 223 (CCPA 1970).

As amended, the claims are directed to “[a] transgenic plant comprising a nucleic acid encoding a microbial endocellulase or endoglucanase” and a transgenic seed obtained therefrom. As noted by the Office Action on page 4 “[t]he specification, via Thomas et al., Collmer et al., Ghangas et al., Wilson and Lao et al., teaches a total of about 20 endoglucanases (presumably  $\beta$ -1,4-endoglucanase) coding sequences from about 12 bacterial species and one fungal species. . . .” Applicants respectfully argue that teaching about 20 examples of endoglucanases is sufficient to show those of ordinary skill in the art the invention as presently claimed.

Regarding claim 14, Applicants respectfully argue that upon teaching that *Thermomonospora fusca* encodes an endoglucanase, it would also lead those of ordinary skill in the art to the other *Thermomonospora* species for other endoglucanases or endocellulases.

Regarding claim 15, it has been amended to recite endoglucanases or endocellulases and avoids this rejection.

Applicants argue the above amendments and remarks overcome these rejections and request their withdrawal.

**Rejections under 35 U.S.C. § 112, ¶ 1: Enablement**

Claims 6-9, 12-23, and 30 are rejected under 35 U.S.C. § 112, first paragraph, as allegedly not being enabled by the specification. The Examiner alleges that the specification does not reasonably provide enablement for nucleic acids encoding all cellulases, plants transformed with those cellulases or non-transformed plants that express cellulases. Applicants respectfully disagree.

Enablement of a disclosure “is not precluded by the necessity for some experimentation such as routine screening.” In re Wands, 858 F.2d 731, 736-7 (Fed. Cir. 1988) (citations omitted). The experimentation necessary must not be undue. Id. At 737. Undue experimentation is experimentation that would require a level of ingenuity beyond what is expected from one of ordinary skill in the field. Fields v. Conover, 170 USPQ 276, 279 (CCPA 1971). The factors that can be considered in determining whether an amount of experimentation is undue have been listed in Wands, 858 F.2d at 737. Among these factors are: the amount of effort involved, the guidance provided by the specification, the presence of working examples, the amount of pertinent literature and the level of skill in the art. The test for undue experimentation is not merely quantitative, since a considerable amount of experimentation is permissible, if it is merely routine. Id.

The relevant inquiry for determining whether the scope of the claims is commensurate with the specification is “whether the scope of enablement provided to one of ordinary skill in the art by the disclosure is such as to be commensurate with the scope of protection sought by the claims.” In re Moore, 439 F.2d 1232, 1236 (CCPA 1971) (emphasis added). “A patent need not teach, and preferably omits, what is well known in the art.” Hybridtech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 231 USPQ 81 (Fed. Cir. 1986), cet. Denied, 480 U.S. 947 (1987).

While predictability of the art can be considered in determining whether an amount of experimentation is undue, mere unpredictability of the result of the experiment is not a consideration. Indeed, the Court of Customs and Patent Appeals has specifically cautioned that the unpredictability of the result of an experiment is not a

basis to conclude that the amount of experimentation is undue (see *In re Angstadt*, 190 USPQ 214 (CCPA 1976)).

The claims as amended are directed to transgenic plants comprising a microbial endoglucanase or endocellulase. The claims do not attempt to claim nucleic acids encoding all cellulases, and do not attempt to claim non-transformed plants that express cellulases.

The Office Action seems to be repeating the written description requirements in the rejection on enablement because the Office action contends that "the specification does not teach a representative number of nucleic acids encoding cellulases, and hence a representative number of plants comprising said nucleic acids" (pages 8-9).

It is not undue experimentation for one of ordinary skill in the art to transform a plant with a different endocellulase or endoglucanase once the description explains how to perform such task with an exemplary endoglucanase. Therefore, the specification as filed is enabled to those of ordinary skill in the art.

#### **Rejection under 35 U.S.C. § 103: Bennett**

Claims 6-8, 16-19, and 21-23 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over Bennett *et al.*, U.S. Patent No. 5,168,064, issued December 1, 1992 ("the '064 Patent").

A finding of obviousness under § 103 requires a determination of the scope and content of the prior art, the level of ordinary skill in the art, the differences between the claimed subject matter and the prior art, and whether the differences are such that the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made. *Graham v. Deere*, 383 U.S. 1 (1966). The relevant inquiry is whether the prior art suggests the invention, and whether the prior art provides one of ordinary skill in the art with a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988). Both the suggestion and the reasonable expectation of success must be founded in the prior art and not in the Applicants' disclosure. *In re Vaeck*, 947 F.2d 488 (Fed. Cir. 1991). Also, the Examiner must also show why it

"would appear" that the references would have been combined. *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

The cited reference does not make obvious the presently claimed invention.

Bennett does not teach, much less describe, the transformation of a plant with a microbial endoglucanase or endocellulase.

Applicants also question whether the tomato endoglucanase would actually be thermostable. The term thermostable usually means that an enzyme has higher activity at temperatures, for example, over 50°C. Applicants do not see any information in the Bennett patent as to whether the tomato endoglucanase was thermostable. Usually, thermostable enzymes are obtained from thermophilic organisms such as bacteria.

Since Bennett does not teach, much less suggest, all the elements of the presently claimed invention, it does not make obvious the invention.

**Rejection of claims under 35 U.S.C. §103(a)**

Claims 6-8, 12-19, 21-23 and 30 are rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Bennett et al. (1992, USP 5,168,064) in view of Lao et al., (J. Bacteriol. 173:3397-3407). In particular, the Examiner alleges it would have been obvious to modify the plants transformed with a nucleic acid encoding endo- $\beta$ -1,4-glucanase as taught by Bennett with nucleic acid encoding endo- $\beta$ 1,4-glucanase from *T. fusca* described in Lao.

The legal standard is set forth above. Again, the Examiner must also show why it "would appear" that the references would have been combined. *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

Applicants respectfully disagree with this rejection as the Office Action fails to show any suggestion to combine the two references to create the presently claimed invention.

Applicants also respectfully disagree with the Examiner's characterization of the claims. The claims as amended are directed to transgenic plants comprising nucleic acid encoding a microbial endocellulase or endoglucanase. The claims are not solely directed to transgenic plants comprising a nucleic acid encoding an endoglucanase from *T. fusca*.

Therefore, the combined references fail to make obvious the presently claimed invention because there is no suggestion to combine the references to teach the invention as presently claimed. The above amendments and remarks overcome this rejection, and Applicants request its withdrawal.

### CONCLUSION

Applicants point out that the above remarks and amendments overcome the rejections. Reconsideration of the application and allowance of all pending claims is earnestly solicited. Should the Examiner wish to discuss any of the above in greater detail or deem that further amendments should be made to improve the form of the claims, the Examiner is invited to telephone the undersigned at the Examiner's convenience.

Respectfully submitted,



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# CAZy - Carbohydrate-Active enZYmes


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## Family GH9


**CAZy Family** Glycoside Hydrolase Family 9

**Known Activities** endoglucanase (EC 3.2.1.4); cellobiohydrolase (EC 3.2.1.91);  $\beta$ -glucosidase (EC 3.2.1.21)

**Mechanism** Inverting

**Catalytic Nucleophile/Base** Asp (experimental)

**Catalytic Proton Donor** Glu (experimental)

**3D Structure Status** Available (see PDB). Fold ( $\alpha / \alpha$ )<sub>6</sub>
**Note** formerly known as cellulase family E.

**Relevant Links** HOMSTRAD; InterPro; PFAM; PROSITE

**Statistics** CAZy(236); GenBank/GenPept (374); Swissprot (190); PDB (17); 3D(7); cryst(1)

Protein	Organism	EC#	GenBank / GenPept	SwissProt	PDB / 3D
scaffoldin CipV	<i>Acetivibrio cellulolyticus</i>	n.d.	AF155197 AAF06064.1	Q9RPL0	
cellulase CelA	<i>Alicyclobacillus acidocaldarius</i> ATCC27009	3.2.1.4	AJ308623 CAC34051.1	Q9AJS0	cryst
cellulase CelA	<i>Anaerocellum thermophilum</i>	3.2.1.91 3.2.1.4	Z86105 CAB06786.1	P96311	
At1g02800 (endo-1,4-glucanase)	<i>Arabidopsis thaliana</i>	3.2.1.4	AF034573 AAC16418.1 AC009525 AAF02887.1 NM_100159 NP_171779.1	O64949 Q9SRX3	
At1g19940/F6F9_1	<i>Arabidopsis thaliana</i>	n.d.	AC022472 AAF79918.1 AC007797 AAG12562.1 AY048245 AAK82507.1 AY113063 AAM47371.1 NM_101849 NP_173423.1	Q9FXI9 Q9LNS3	
At1g22880/F19G10.16	<i>Arabidopsis thaliana</i>	n.d.	AF000657 AAB72171.1 NM_102134 NP_173701.1	O23134	
At1g23210/T26J12.2 or F26F24.6	<i>Arabidopsis thaliana</i>	n.d.	AC002311 AAC00616.1 AC005292 AAF86995.1 NM_102170 NP_173735.1	O49296	
At1g48930/F27J15.28 OR F27K7.5	<i>Arabidopsis thaliana</i>	n.d.	AC016041 AAF69707.1 AC084414 AAG29742.1 BT002935 AAO22749.1 BT005638 AAO64058.1 NM_103786 NP_175323.1	Q9FVQ2 Q9M995	
At1g64390/F15H21_9	<i>Arabidopsis thaliana</i>	n.d.	AC066689 AAG21508.1 AC066689 AAG51703.1 AF372940 AAK50080.1 AY143945 AAN28884.1 BT000696 AAN31840.1 NM_105114 NP_176621.1	Q8H160 Q9C7W3	
At1g65610/F5I14.14	<i>Arabidopsis thaliana</i>	n.d.	AC001229 AAB60922.1 NM_105234 NP_176738.1	O04478	

At1g70710 (endo-1,4-glucanase)	<i>Arabidopsis thaliana</i>	3.2.1.4	AC011663 AAF09072.1 AC011663 AAG52329.1 AY048283 AAK82545.1 AY074552 AAL67092.1 X98543 AAO30718.1 X98544 CAA67156.1 NM_105739 CAA67157.1 <b>NP_177228.1</b>	O23696 O23697 Q9CAC1
At1g71380/F26A9.24	<i>Arabidopsis thaliana</i>	n.d.	U17888 AAA90944.1 AC016163 AAF23348.1 AC016163 <b>AAG51817.1</b> AY086043 AAM63253.1 NM_105807 NP_177294.1	Q38817 Q8LDE8 Q9C9H5
At1g75680/F10A5.13	<i>Arabidopsis thaliana</i>	n.d.	AC006434 <b>AAF87112.1</b> AY039938 AAK64042.1 AY086475 AAM63477.1 AY150451 AAN12892.1 NM_106219 NP_177697.1	Q8LCP6 Q9LR07
At2g32990/T21L14.7	<i>Arabidopsis thaliana</i>	n.d.	AC003033 AAB91971.1 AY062439 AAL32517.1 BT008885 AAP68324.1 NM_128859 NP_180858.1	<b>O48766</b>
At2g44540/F4I1.36 or F16B22.3	<i>Arabidopsis thaliana</i>	n.d.	AC004521 AAC16100.1 AC003672 AAC27456.1 AC004521 AAM14965.1 NM_130018 NP_181982.1	<b>O64889</b>
At2g44550/F4I1.37 or F16B22.4	<i>Arabidopsis thaliana</i>	n.d.	AC004521 AAC16101.1 AC003672 AAC27457.1 AC004521 AAM14964.1 NM_130019 NP_181983.1	<b>O64890</b>
At2g44560/F16B22.5	<i>Arabidopsis thaliana</i>	n.d.	AC004521 AAC16102.1 AC003672 AAC27458.1 AC004521 AAM14961.1 AK175889 BAD43652.1 NM_130020 NP_181984.1	<b>O64891</b> Q8S8Q4
At2g44570/F16B22.6	<i>Arabidopsis thaliana</i>	n.d.	AC003672 AAC27459.1 NM_130021 NP_181985.1	<b>O80497</b>
At3g43860/T28A8_150	<i>Arabidopsis thaliana</i>	n.d.	AY072099 <b>AAL59921.1</b> AL162691 CAB83158.1 NM_114254 NP_189972.1	Q8VYG3 Q9LZG2
AT4g02290/T2H3_5	<i>Arabidopsis thaliana</i>	n.d.	AF075597 AAC28173.1 AY079162 AAL85001.1 AY101518 AAM26639.1 AL161494 CAB80722.1 NM_116462 NP_192138.1	<b>O81416</b>
At4g09740/F17A8.90	<i>Arabidopsis thaliana</i>	n.d.	AL049482 <b>CAB39641.1</b> AL161515 CAB78097.1 NM_117042 NP_192712.1	Q9SZ90
At4g11050/F2P3.1	<i>Arabidopsis thaliana</i>	n.d.	AF080120 AAC35539.1 AY133685 AAM91619.1 AL049876 CAB43040.1 AL161518 CAB81206.1 NM_117175 NP_192843.2	<b>O82513</b> Q8L710
At4g23560/F9D16.30	<i>Arabidopsis thaliana</i>	n.d.	AL035394 <b>CAA23022.1</b> AL161559 CAB79311.1 NM_118487 NP_194087.1	Q9SUS0
At4g24260/T22A6.90	<i>Arabidopsis thaliana</i>	n.d.	AL078637 <b>CAB45061.1</b> AL161561 CAB79336.1 NM_118559 NP_194157.1	Q9STW8
At4g38990/F19H22.90	<i>Arabidopsis thaliana</i>	n.d.	AL035679 <b>CAB38819.1</b> AL161594 CAB80562.1 NM_120059 NP_195610.1	Q9SVJ4
At4g39000/F19H22.100	<i>Arabidopsis thaliana</i>	n.d.	AK117850 BAC42491.1 AL035679 <b>CAB38820.1</b> AL161594 CAB80563.1 NM_120060 NP_195611.1	Q8GY58 Q9SVJ3
At4g39010/F19H22.110	<i>Arabidopsis thaliana</i>	n.d.	AY059825 <b>AAL24307.1</b>	Q93YQ7

At5g49720 (endo-1,4-glucanase KORRIGAN)	<i>Arabidopsis thaliana</i>	3.2.1.4	BT002204 AAN72215.1 AL035679 CAB38821.1 AL161594 CAB80564.1 NM_120061 NP_568050.1	Q9SVJ2	
BLi01880 or BL01232	<i>Bacillus licheniformis DSM 13 ATCC 14580</i>	n.d.	U37702 AAB60304.1 AF074092 AAC33467.1 AF074375 AAC35344.1 AF073875 AAC83240.1 AY037218 AAK59818.1 AY086165 AAM63370.1 BT002221 AAN72232.1 AB025613 BAA98160.1 NM_124350 NP_199783.1	Q38890 Q8H0S4 Q8LD74 Q94C24	
cellulase (Cel9A)	<i>Cel9A</i> <i>Bacillus licheniformis GXN151</i>	n.d.	CP000002 AAU23415.1 AE017333 AAU40775.1		
endoglucanase A (EglA)	<i>Bacillus pumilus</i>	3.2.1.4	AY445620 AAR29083.1		
endoglucanase	<i>Bacillus pumilus S-27</i>	3.2.1.4	AY339624 AAQ91573.1		
endoglucanase CelB	<i>Bacillus sp. BP23</i>	3.2.1.4	AF206716 AAF15367.1	Q9R9H6	
endo-1,4-glucanase IV	<i>Bacillus sp. KSM-522</i>	3.2.1.4	AJ133614 CAB38941.1	Q9Z4I1	
cellulase Cel16	<i>Brassica napus</i>	3.2.1.4	AJ242807 CAB51903.1	Q9STD9	
endo-1,4-glucanase C	<i>Butyrivibrio fibrisolvens H17c</i>	3.2.1.4	X55732 CAA39264.1	P23658	
CelA	<i>Caldicellulosiruptor saccharolyticus</i>	3.2.1.4	L32742 AAA91086.1	P22534	
CelE	<i>Caldicellulosiruptor sp. Tok7B.1</i>	n.d.	AF078042 AAK06394.1		
ccx1 (fragment)	<i>Capsicum annuum</i>	3.2.1.4	X83709 CAA58684.1	Q43749	
ccx2 (fragment)	<i>Capsicum annuum</i>	3.2.1.4	X83710 CAA58685.1	Q43750	
ccx3 (fragment)	<i>Capsicum annuum</i>	3.2.1.4	X83711 CAA58686.1	Q43751	
endo-1,4-glucanase	<i>Capsicum annuum</i>	3.2.1.4	X97190 CAA65828.1	Q96546	
endo-1,4-glucanase			AJ010950 CAB59900.1	Q9SML6	
endo-1,4-glucanase	<i>Capsicum annuum</i>	3.2.1.4	X97189 CAA65827.1	Q96547	
endo-1,4-glucanase	<i>Capsicum annuum</i>	3.2.1.4	X97188 CAA65826.1	Q96545	
endo-1,4-glucanase C	<i>Capsicum annuum</i>	3.2.1.4	X87323 CAA60737.1	Q42660	
CC2227	<i>Caulobacter crescentus CB15</i>	n.d.	AE005894 AAK24198.1	Q9A667	
endo-1,4-glucanase B	<i>Cel9A</i> <i>Cellulomonas fimi</i>	3.2.1.4	NC_002696 NP_421030.1		
endo-1,4-glucanase C	<i>Cel9B</i> <i>Cellulomonas fimi</i>	3.2.1.4	M64644 AAA23086.1	P26225	
endo-1,4-glucanase A	<i>Cellvibrio japonicus</i> (formerly <i>Pseudomonas cellulosa</i> )	3.2.1.4	M29708 AAA23088.1	P14090	3D
putative endoglucanase (EG)	<i>Cherax quadricarinatus</i>	n.d.	X57858 CAA40993.1		
CV2882	<i>Chromobacterium violaceum ATCC 12472</i>	n.d.	X12570 CAA31082.1	P10476	
acidic cellulase	<i>Citrus sinensis</i>	3.2.1.4	AF000135 AAB65155.1	O22297	
basic cellulase	<i>Citrus sinensis</i>	3.2.1.4	AF000136 AAB65156.1	O22298	
CAC0561	<i>Clostridium acetobutylicum ATCC 824</i>	n.d.	AE007571 AAK78540.1	Q97LJ9	
CAC0913	<i>Clostridium acetobutylicum ATCC 824</i>	n.d.	NC_003030 NP_347200.1		
CAC0917	<i>Clostridium acetobutylicum ATCC 824</i>	n.d.	AE007607 AAK78889.1	Q97KK5	
endoglucanase (CelG;CAC0916)	<i>Clostridium acetobutylicum ATCC 824</i>	3.2.1.4	NC_003030 NP_347549.1		
CelE	<i>Cel9E</i> <i>Clostridium cellulolyticum</i>	n.d.	AE007607 AAK78893.1	Q97KK2	
cellulase H (CelH)	<i>Cel9H</i> <i>Clostridium cellulolyticum</i>	3.2.1.4	NC_003030 NP_347553.1		
cellulase J (CelJ)	<i>Cel9J</i> <i>Clostridium cellulolyticum</i>	3.2.1.4	AE007607 AAK78892.1	Q97KK3	
cellulase M (CelM)	<i>Cel9M</i> <i>Clostridium cellulolyticum</i>	3.2.1.4	NC_003030 NP_347552.1		
endo-1,4-glucanase G (CelCCG)	<i>Cel9G</i> <i>Clostridium cellulolyticum</i>	3.2.1.4	M87018 AAA73868.1	P37700	1G87 A 1GA2 A 1K72 B

1KFG A

endo-1,4-glucanase H (fragment)		<i>Clostridium cellulovorans</i>	3.2.1.4	U34793 AAC38572.2	O65987
endoglucanase K (EngK)		<i>Clostridium cellulovorans</i>	3.2.1.4	AF132735 AAF06107.1	Q9RGE8
endoglucanase L (EngL)		<i>Clostridium cellulovorans</i>	3.2.1.4	AF132735 AAF06109.1	Q9RGE6
endoglucanase M (EngM)		<i>Clostridium cellulovorans</i>	3.2.1.4	AF132735 AAF06111.2	Q9LAJ2
endoglucanase Y (EngY)		<i>Clostridium cellulovorans</i>	3.2.1.4	AF105330 AAG59608.1	Q9AQF4
EngO		<i>Clostridium cellulovorans</i>	n.d.	AY646113 AAT66046.1	
cellulase (CbhA) (fragment)		<i>Clostridium sp. JC3</i>	n.d.	AB093547 BAC65236.1	Q845W7
endo-1,4-glucanase Z (avicelase I) (CelZ)		<i>Clostridium stercorarium</i>	3.2.1.4	X55299 CAA39010.1	P23659
endoglucanase Q (CelQ)	<i>Cel9I</i>	<i>Clostridium thermocellum</i>	3.2.1.4	AB047845 BAB33148.1	Q9AJF8
CelJ	<i>Cel9D-</i>	<i>Clostridium thermocellum F1</i>	3.2.1.4	D83704 BAA12070.1	P71140 1WMX A
	<i>Cel44A</i>				
endoglucanase T (CelT)		<i>Clostridium thermocellum F1</i>	3.2.1.4	AB044407 BAB79196.2	Q8VV73
$\beta$ -1,4-glucanase (CelR)		<i>Clostridium thermocellum F7</i>	n.d.	AJ585346 CAE51308.1	
cellobiohydrolase A (CbhA)		<i>Clostridium thermocellum F7</i>	3.2.1.91	AJ005783 CAA06693.1 X80993 CAA56918.1	Q59325
endo-1,4-glucanase (CelN)	<i>Cel9N</i>	<i>Clostridium thermocellum F7</i>	3.2.1.4	AJ275974 CAB76935.1	Q9L3J5
cellobiohydrolase CelK		<i>Clostridium thermocellum JW 20 / F7</i>	3.2.1.4	AF039030 AAC06139.1	O68438
cellobiohydrolase (CbhA) (fragment)		<i>Clostridium thermocellum JW20</i>	3.2.1.91	AY494547 AAR87745.1	1RQ5 A 1UT9 A
endo-1,4-glucanase D (CelD)	<i>Cel9A</i>	<i>Clostridium thermocellum NCIB 10682</i>	3.2.1.4	X04584 CAA28255.1	P04954
endo-1,4-glucanase F	<i>Cel9B</i>	<i>Clostridium thermocellum NCIB 10682</i>	3.2.1.4	X60545 CAA43035.1	P26224
endo-1,4-glucanase I (Cell or CMC)	<i>Cel9C</i>	<i>Clostridium thermocellum NCIB10682 / F7</i>	3.2.1.4	L04735 AAA20892.1 AJ275974 CAB76932.1	Q02934 Q9L3J8
cellulase		<i>Coptotermes acinaciformis</i>	n.d.	AF336120 AAK12339.1	Q9BMCT
endo- $\beta$ -1,4-glucanase (CfEG1A)		<i>Coptotermes formosanus</i>	3.2.1.4	AB058667 BAB40693.1	
endo- $\beta$ -1,4-glucanase (CfEG1b)		<i>Coptotermes formosanus</i>	3.2.1.4	AB058668 BAB40694.1	
endo- $\beta$ -1,4-glucanase (CfEG2)		<i>Coptotermes formosanus</i>	3.2.1.4	AB058669 BAB40695.1	Q9BLD3
endo- $\beta$ -1,4-glucanase (CfEG3)		<i>Coptotermes formosanus</i>	3.2.1.4	AB058670 BAB40696.1	Q9BLD2
endo- $\beta$ -1,4-glucanase (CfEG4)		<i>Coptotermes formosanus</i>	3.2.1.4	AB058671 BAB40697.1	Q9BLD1
endo-1,4-glucanase		<i>Dictyostelium discoideum</i>	3.2.1.4	M33861 AAA52077.1	P22699
cellulose-binding protein E1 (Cbpe1)		<i>Eubacterium cellulosolvens</i>	n.d.	AB072270 BAB86305.1	
endo-1,4-glucanase A		<i>Fibrobacter succinogenes</i>	3.2.1.4	M58520 AAA24894.1 M58520 AAA24895.1	P23665 P23664
endo-1,4-glucanase B		<i>Fibrobacter succinogenes</i>	3.2.1.4	L14436 AAA68129.1	Q59444
endo-1,4-glucanase D (CelD)		<i>Fibrobacter succinogenes</i>	3.2.1.4	U05897 AAC44386.1	P77864
endo-1,4-glucanase E		<i>Fibrobacter succinogenes</i>	3.2.1.4	U05897 AAC44385.1	P71326
endo-1,4-glucanase C		<i>Fibrobacter succinogenes BL2</i>	3.2.1.4	L48039 AAC41523.1	Q59442
endo-glucanase 1 (fragment)		<i>Ficus carica</i>	n.d.	AY487306 AAR27059.1	
endo-glucanase 2 (fragment)		<i>Ficus carica</i>	n.d.	AY487307 AAR27060.1	
endo-1,4-glucanase		<i>Fragaria x ananassa</i>	3.2.1.4	AF054615 AAC78298.2 AJ006349 CAB43938.1 AJ414708 CAC94006.1	O65186
endo-1,4-glucanase Cel1		<i>Fragaria x ananassa</i>	3.2.1.4	AF051346 AAC78293.1 AJ223386 CAA11301.1	Q9SB85 Q9ZTL0
endo-1,4-glucanase Cel1		<i>Fragaria x ananassa</i>	3.2.1.4	AF074923 AAC95009.1 AJ006348 AAE73726.1 CAB43937.1	O81403
ripening-related putative cellulase		<i>Fragaria x ananassa</i>	n.d.	AF041405 AAD12577.1 AJ414709 CAC94007.1	Q9ZTS0
endo-1,4- $\beta$ -glucanase (fragment)		<i>Fragaria x ananassa Fengxiang</i>	n.d.	AY619689 AAT40310.1	
PbgB protein (fragment)		<i>Fusobacterium mortiferum</i>	n.d.	U81184 AAB49340.1	P94794
endo-1,4-glucanase (fragment)		<i>Glycine max</i>	3.2.1.4	U34755 AAA79877.1	Q39826
putative cellulase (fragment)		<i>Glyptotermes sp. Wyong</i>	n.d.	AB024736 BAA83767.1	Q9U080
abscission-specific cellulase (fragment)		<i>Gossypium hirsutum</i>	n.d.	AF538680 AAN04496.1	Q8LJP6

endo-1,4- $\beta$ -glucanase	<i>Gossypium hirsutum</i>	3.2.1.4	AY253447 AAP83128.1 AY574906 AAS87601.1	
endo-1,4-glucanase (fragment)	<i>Gossypium hirsutum</i>	3.2.1.4	D88417 BAA21111.1	O23954
cellulase (Hdcel-1)	<i>Haliotis discus</i>	n.d.	AB092978 BAC67186.1	Q86M37
cellulase (Hdcel-1) (fragment)	<i>Haliotis discus</i>	n.d.	AB092979 BAC67187.1	Q86M36
cellulase (CelhdD)	<i>Haliotis discus discus</i>	n.d.	AB162804 BAD44734.1	
cellulase	<i>Haliotis discus hannai</i>	n.d.	AB125892 BAD01504.1	
HsEG1 (fragment)	<i>Hodotermopsis sjoeestedti</i>	n.d.	AB118662 BAD11951.1	
HsEG2 (fragment)	<i>Hodotermopsis sjoeestedti</i>	n.d.	AB118794 BAD12002.1	
HsEG3 (fragment)	<i>Hodotermopsis sjoeestedti</i>	n.d.	AB118795 BAD12003.1	
HsEG4 (fragment)	<i>Hodotermopsis sjoeestedti</i>	n.d.	AB118796 BAD12004.1	
unnamed protein product	<i>Homo sapiens</i>	n.d.	AK095918 BAC04648.1	Q8N909
endoglucanase Cel1	<i>Hordeum vulgare Himalaya</i>	3.2.1.4	AB040769 BAA94257.1	Q9MAY8
endo-1,4- $\beta$ -glucanase Cel1	<i>Lilium longiflorum</i>	3.2.1.4	AY205300 AAP38171.1	Q7XB15
Lin0032	<i>Listeria innocua Clip11262</i>	n.d.	AL596163 CAC95265.1 NC_003212 NP_469379.1	
Lmo0033	<i>Listeria monocytogenes EGD-e</i>	n.d.	AL591973 CAC98248.1 NC_003210 NP_463566.1	
LMOf2365_0042	<i>Listeria monocytogenes str. 4b F2365</i>	n.d.	AE017322 AAT02830.1	
cellulase 6 (fragment)	<i>Lycopersicon esculentum</i>	n.d.	- AAB46829.1	
endo-1,4-glucanase	<i>Lycopersicon esculentum</i>	3.2.1.4	Y11268 CAA72133.1	O04972
endo-1,4-glucanase	<i>Lycopersicon esculentum</i>	3.2.1.4	U20590 AAA80495.1	Q42875
endo-1,4-glucanase (Cel3)	<i>Lycopersicon esculentum</i>	3.2.1.4	- AAB46826.1 U78526 AAC49704.1	O04890
endo-1,4-glucanase 1	<i>Lycopersicon esculentum</i>	3.2.1.4	U13054 AAA69908.1 - AAB46824.1 - AAQ68347.1	Q42871
endo-1,4-glucanase 2	<i>Lycopersicon esculentum</i>	3.2.1.4	U13055 AAA69909.1	Q42872
endo-1,4-glucanase 5	<i>Lycopersicon esculentum</i>	3.2.1.4	AAB46828 AAB46828.1 AF077339 AAC62241.1 AF077340 AAC64045.1	O82473 Q9SBD3
endo-1,4-glucanase 8	<i>Lycopersicon esculentum</i>	3.2.1.4	AF098292 AAD08699.1	Q9ZSP9
endo-1,4- $\beta$ -glucanase MdEG1	<i>Malus x domestica</i>	n.d.	AY350734 AAQ55294.1	
Cel (fragment)	<i>Mangifera indica</i>	n.d.	AJ505607 CAD44261.1	
Cel (fragment)	<i>Mangifera indica</i>	n.d.	AJ505608 CAD44262.1 AJ505609 CAD44263.1	
$\beta$ -1,4-endoglucanase (Cel1)	<i>Mastotermes darwiniensis</i>	3.2.1.4	AJ511339 CAD54726.1	Q8IFU6
$\beta$ -1,4-endoglucanase (Cel2)	<i>Mastotermes darwiniensis</i>	3.2.1.4	AJ511340 CAD54727.1	Q8IFU5
$\beta$ -1,4-endoglucanase (Cel3)	<i>Mastotermes darwiniensis</i>	3.2.1.4	AJ511341 CAD54728.1	Q8IFU4
$\beta$ -1,4-endoglucanase (Cel4)	<i>Mastotermes darwiniensis</i>	3.2.1.4	AJ511342 CAD54729.1	Q8IFU3
$\beta$ -1,4-endoglucanase (Cel5)	<i>Mastotermes darwiniensis</i>	3.2.1.4	AJ511343 CAD54730.1	Q8IFU2
Cel1	<i>Medicago truncatula</i>	n.d.	AY308955 AAQ63883.1	
endocellulase (EgtA)	<i>Myxobacter sp. AL-1</i>	3.2.1.4	AF180561 AAF19168.1	Q9RAI8
endo-1,4-glucanase (fragment)	<i>Nasutitermes takasagoensis</i>	n.d.	AB019588 BAA77347.1	Q9XXW7
endo-1,4-glucanase (NtEG)	<i>Nasutitermes takasagoensis</i>	3.2.1.4	AB013272 BAA33708.1 AB019146 BAA76619.1	O77044 1KS8 A 1KSC A 1KSD A
NtEG2 (fragment)	<i>Nasutitermes takasagoensis</i>	n.d.	AB118803 BAD12011.1	
endo-1,4-glucanase (NwEG)	<i>Nasutitermes walkeri</i>	3.2.1.4	AB013273 BAA33709.1	O77045
NkEG1 (fragment)	<i>Neotermes koshunensis</i>	n.d.	AB118797 BAD12005.1	
NkEG2 (fragment)	<i>Neotermes koshunensis</i>	n.d.	AB118798 BAD12006.1	
NkEG3 (fragment)	<i>Neotermes koshunensis</i>	n.d.	AB118799 BAD12007.1	
ORF	<i>Nicotiana alata</i>	n.d.	AF128404 AAD28258.1	Q9XF22
endo-1,4-glucanase (Cel2)	<i>Nicotiana tabacum</i>	3.2.1.4	AF362948 AAL30453.1	Q93WZ0
endo-1,4-glucanase (Cel5) (fragment)	<i>Nicotiana tabacum</i>	n.d.	AF362951 AAL30456.1	Q93WY7
endo-1,4-glucanase (Cel7)	<i>Nicotiana tabacum</i>	3.2.1.4	AF362947 AAL30452.1	Q93WZ1

endo-1,4-glucanase (Cel8)	<i>Nicotiana tabacum</i>	3.2.1.4	AF362949 AAL30454.1	Q93WY9
endo-1,4-glucanase precursor (Cel4) (fragment)	<i>Nicotiana tabacum</i>	n.d.	AF362950 AAL30455.1	Q93WY8
OfEG1 (fragment)	<i>Odontotermes formosanus</i>	n.d.	AB118800 BAD12008.1	
OfEG2 (fragment)	<i>Odontotermes formosanus</i>	n.d.	AB118801 BAD12009.1	
OfEG3 (fragment)	<i>Odontotermes formosanus</i>	n.d.	AB118802 BAD12010.1	
006-35	<i>Oikopleura dioica</i>	n.d.	AY449462 AAS21473.1	
B1011A07.20	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP003722 BAB92772.1	Q8LQ92
B1339H09.3 or OSJNOa018M17.6	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP006453 BAD26493.1	
OJ1112_E07.17-1	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP007149 BAD26550.1	
OJ1136_C11.27 (fragment)	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP004027 BAD45673.1	
OJ1293_A01.6	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP004846 BAD19513.1	
OJ1531_B07.26	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005682 BAD33772.1	
OSJNBa0018M05.14 or OSJNBa0018M05.16 OSJNBa0050G13.22	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AL606457 CAE03239.1	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AL606457 CAE03241.2	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005412 BAD38054.1	
OSJNBa0067K08.12 or OSJNBa0067K08.14 OSJNBa0074P11.11	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AL606627 CAD41248.1	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AL606627 CAD41250.2	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AC135914 AAT44235.1	
OSJNBb0016H12.13	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AC118133 AAP03405.1	Q84R49
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AY387483 AAR07086.1	
P0041A24.5	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	BX548155 CAE01493.1	
P0427G12.14	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005657 BAD10555.1	
P0434E03.25	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP004689 BAD05437.1	
P0456B03.7	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP004463 BAC55745.1	Q84Q51
P0481E08.13	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP003614 BAD53575.1	
P0489G09.19	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP002094 BAA96207.1	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP002745 BAC00551.1	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	NM_188489 NP_913378.1	
P0489G09.22	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP002094 BAA96209.1	
	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP002745 BAC00553.1	
P0575F10.17	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP004885 BAD07956.1	
P0624H09.19	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005619 BAD46308.1	
P0643A10.32	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005319 BAD16147.1	
P0684F11.11	<i>Oryza sativa</i> ( <i>japonica</i> cultivar-group)	n.d.	AP005112 BAD16040.1	
endoglucanase 1 (EG1)	<i>Panesthia cribrata</i>	3.2.1.4	AF220596 AAF80584.1	Q9NCE3
endoglucanase 2 (EG2)	<i>Panesthia cribrata</i>	3.2.1.4	AF220597 AAF80585.1	Q9NCE2
endo-1,4-glucanase 1	<i>Persea americana</i>	3.2.1.4	M17634 AAA32912.1	<b>P05522</b>
			X59944 AAO30720.1	
			CAA42569.1	
endo-1,4-glucanase 2 (fragment)	<i>Persea americana</i>	3.2.1.4	X55790 CAA39314.1	<b>P23666</b>
Cel9A	<i>Phanerochaete chrysosporium BKM-F-1767</i>	n.d.	AY094488 AAM22492.1	Q8NJJ0
endo-1,4-glucanase	<i>Phaseolus vulgaris</i>	3.2.1.4	M57400 AAA02563.1	<b>P22503</b>
endo-1,4-glucanase	<i>Phaseolus vulgaris</i>	3.2.1.4	U34754 AAC78504.1	Q43105

PBPRA0520		<i>Photobacterium profundum</i> SS9	n.d.	CR378664 CAG18943.1	
endo-1,4-glucanase 1		<i>Pinus radiata</i>	3.2.1.4	U76725 AAC12684.1	O64401
endo-1,4-glucanase 2		<i>Pinus radiata</i>	3.2.1.4	U76756 AAC12685.1	O64402
cellulase Cel9A	Cel9A	<i>Piromyces sp. E2</i>	n.d.	AF459452 AAM81966.1 AF459453 AAM81967.1	Q8NJK5 Q8NJK6
endoglucanase Cel9 (fragment)		<i>Piromyces sp. E2</i>	n.d.	AF500793 AAP30753.1	Q870A8
endo-1,4- $\beta$ -glucanase (EGL2)		<i>Pisum sativum</i>	3.2.1.4	AB032830 BAA85150.1	Q9SSU7
endo-1,4-glucanase		<i>Pisum sativum</i>	3.2.1.4	L41046 AAA96135.1	Q41012
Kor-1 (fragment)		<i>Pisum sativum</i>	n.d.	AJ621355 CAF18445.1	
endo-1,4-glucanase Cel1		<i>Populus alba</i>	3.2.1.4	D32166 BAA06877.1 AB049199 BAB39482.1	Q40763 Q9AVI5
endo-1,4-glucanase Cel2		<i>Populus alba</i>	3.2.1.4	AB025796 BAA77239.1 AB049200 BAB39483.1	Q9XIY8
Cel9A	Cel9A	<i>Populus tremula x Populus tremuloides</i>	3.2.1.-	AY660967 AAT75041.1	
Cel9B	Cel9B	<i>Populus tremula x Populus tremuloides</i>	3.2.1.-	AY660968 AAT75042.1	
endo-1,4- $\beta$ -glucanase (Kor1)		<i>Populus tremuloides</i>	n.d.	AY535003 AAS45400.1	
endo-1,4-glucanase		<i>Prunus persica</i>	3.2.1.4	X96853 CAA65597.1 X96856 CAA65600.1	P94114
endo-1,4-glucanase (fragment)		<i>Prunus persica</i>	3.2.1.4	Z23119 CAA80665.1	P38534
endo- $\beta$ -1,4-glucanase (Pcel20)		<i>Prunus persica</i>	3.2.1.4	X96854 CAA65598	O24280
(fragment)					
endoglucanase Cel9A	Cel9A	<i>Pseudomonas sp. SK38</i>	3.2.1.4	AF296443 AAG49558.1	Q9APG3
endo-1,4-glucanase		<i>Pseudomonas sp. YD-15</i>	3.2.1.4	AF033262 AAD01959.1	Q9Z3X7
endo-1,4- $\beta$ -D-glucanase (PC-EG1)		<i>Pyrus communis</i>	3.2.1.4	AB084463 BAC22690.1	Q8GTP6
endo-1,4- $\beta$ -D-glucanase (PC-EG2)		<i>Pyrus communis</i>	3.2.1.4	AB084464 BAC22691.1	Q8GTP5
cellulase		<i>Reticulitermes flavipes</i>	n.d.	AY572862 AAU20853.1	
endo-1,4-glucanase (RsEG)		<i>Reticulitermes speratus</i>	3.2.1.4	AB012394 BAA28815.1 AB008778 BAA31326.1 AB023398 BAA74961.1	O76130 Q9U8X4
endo-1,4-glucanase 2 (RsEG2)		<i>Reticulitermes speratus</i>	3.2.1.4	AB019095 BAA34050.1 AB019353 BAA34120.1 AB023399 BAA74962.1	O96106 Q9U901
Cellulase Cel9B	Cel9B	<i>Ruminococcus albus</i> 8	n.d.	AY422810 AAR01216.1	
processive endocellulase (Cel9C)	Cel9C	<i>Ruminococcus albus</i> 8	n.d.	AY632899 AAT48118.1	
cellulase VI (Cel9A)	Cel9A	<i>Ruminococcus albus</i> F-40	n.d.	AB028321 BAB64431.1	Q93IE6
endo-1,4-glucanase D (fragment)		<i>Ruminococcus flavefaciens</i> FD-1	3.2.1.4	L05368 AAA17731.1	Q52746
endo-1,4-glucanase		<i>Sambucus nigra</i>	3.2.1.4	X74290 CAA52343.1	Q43149
SmEG1 (fragment)		<i>Sinocapritermes mushae</i>	n.d.	AB118804 BAD12012.1	
SmEG2 (fragment)		<i>Sinocapritermes mushae</i>	n.d.	AB118805 BAD12013.1	
SmEG3 (fragment)		<i>Sinocapritermes mushae</i>	n.d.	AB118806 BAD12014.1	
endo 1,4-glucanase (SLEG.1)		<i>Stellaria longipes</i> 1D	3.2.1.4	U59308 AAB02932.1	Q43146
(fragment)		(alpine)			
Cel1 (SCO0765 or SCF81.24c)		<i>Streptomyces coelicolor</i> A3(2)	n.d.	AL133171 CAB61539.1 NC_003888 NP_625068.1	Q9RJC8
SCO7583 or SC5F1.37		<i>Streptomyces coelicolor</i> A3(2)	n.d.	AL450165 CAC16463.1 NC_003888 NP_631626.1	Q9F392
endo-1,4-glucanase I		<i>Streptomyces reticuli</i>	3.2.1.4	X65616 CAA46570.1	Q05156
slr0897		<i>Synechocystis sp. PCC 6803</i>	n.d.	D64003 BAA10447.1 NC_000911 NP_442377.1	Q55365
glucanase (fragment)		<i>Theobroma cacao</i>	n.d.	AY487173 AAS49036.1	
endo-1,4-glucanase E1	Cel9B	<i>Thermobifida fusca</i>	3.2.1.4	L20094 AAC06387.1	Q08166
endo/exo-1,4-glucanase E4	Cel9A	<i>Thermobifida fusca</i>	3.2.1.4	M73322 AAA27397.1 L20093 AAB42155.1	P26221 Q08167
endo-1,4- $\beta$ -glucanase		<i>Triticum aestivum</i>	n.d.	AY091512 AAM13693.1	Q8RWR6
ORF (fragment)		<i>Triticum aestivum</i>	n.d.	AJ577371 CAE53892.1	
cellulase		<i>uncultured bacterium</i>	n.d.	AJ537595 CAD61242.1	
$\beta$ -glucosidase (BglA;VC0615)		<i>Vibrio cholerae</i> N16961	3.2.1.21	AE004147 AAF93781.1	Q9KUA8

VP2484	<i>Vibrio parahaemolyticus</i> RIMD 2210633	n.d.	NC_002505 NP_230264.1 AP005081 BAC60747.1 NC_004603 NP_798863.1
VV11668	<i>Vibrio vulnificus</i> CMCP6	n.d.	AE016802 AAO10085.1 NC_004459 NP_760558.1
VV2739	<i>Vibrio vulnificus</i> YJ016	n.d.	AP005341 BAC95503.1 Q7MHX8 NC_005139 NP_935532.1
CEL1 (fragment)	<i>Vitis vinifera</i>	n.d.	AY043236 AAK81879.1 Q94B12
CEL2 (fragment)	<i>Vitis vinifera</i>	n.d.	AY043235 AAK81878.1 Q94B13
Egl2	<i>Xanthomonas axonopodis</i> pv. <i>citri</i> str. 306	n.d.	AE011891 AAM37373.1 NC_003919 NP_642837.1
endo-1,4- $\beta$ -D-glucanase (Egl2)	<i>Xanthomonas campestris</i> pv. <i>campestris</i>	3.2.1.4	AJ245855 CAB63115.1 Q9RBJ4
Egl2 (cellulase)	<i>Xanthomonas campestris</i> pv. <i>campestris</i> str. ATCC 33913	n.d.	AE012348 AAM41665.1 NC_003902 NP_637741.1

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Please send your comments to **Bernard Henrissat, Pedro Coutinho or Mark Stam**